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(12) UK Patent Application (19) GB (11) 2 311 799 (13) A

(43) Date of A Publication 08.10.1997

(21) Application No 9607050.3

(22) Date of Filing 03.04.1996

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(51) INT CL⁶
B60J 10/00

(52) UK CL (Edition O)
E1J JGN
E1R RRT

(56) Documents Cited
GB 2285471 A GB 2259730 A EP 0632184 A1
US 4616446 A

(58) Field of Search
UK CL (Edition O) E1J JED JGN , E1R RRC RRD RRF
RRL RRP RRQ RRT RRV RRX
INT CL⁶ B60J 10/00 10/02 10/04 , E06B 3/54 3/58 7/16
7/22 7/23
Online: World Patents Index

(54) Sealing and guiding strip for the sharp corner of a vehicle window

(57) A window sealing and guiding channel 18 for a window frame carried by a vehicle door is arranged to match the sharp angle at the corner of the frame. The sealing lip 28 of channel 18 is severed from the channel wall 24 from a point on one side of the sharp corner, through the sharp corner to the end of the channel and this lip is bent into a smooth curve A, to bridge across the sharp corner. The second sealing lip 30 is also severed from its side wall in the region of the sharp corner, and is cut through to form a mitred joint matching the angle at the sharp corner. The remainder of the channel 18 is removed at the sharp corner and replaced by a previously moulded insert, having a channel-form at the sharp corner, and an extended wall portion 24A filling the gap where the inner lip 28 bridges across the corner.

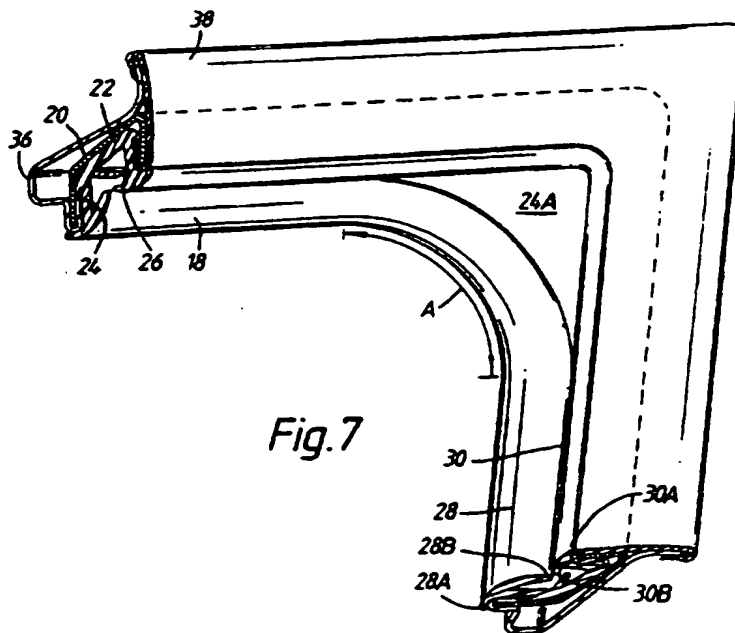


Fig. 7

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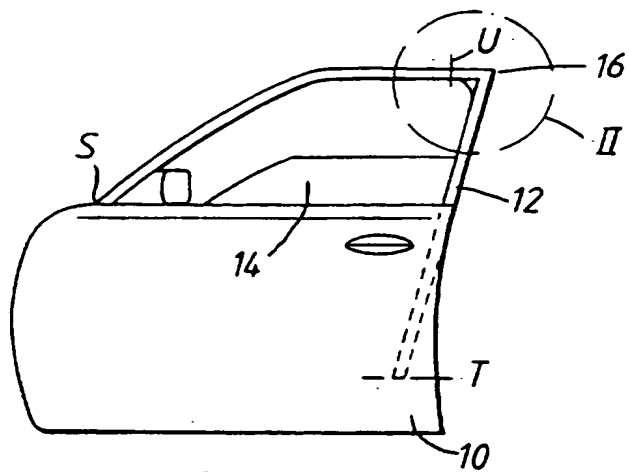


Fig. 1

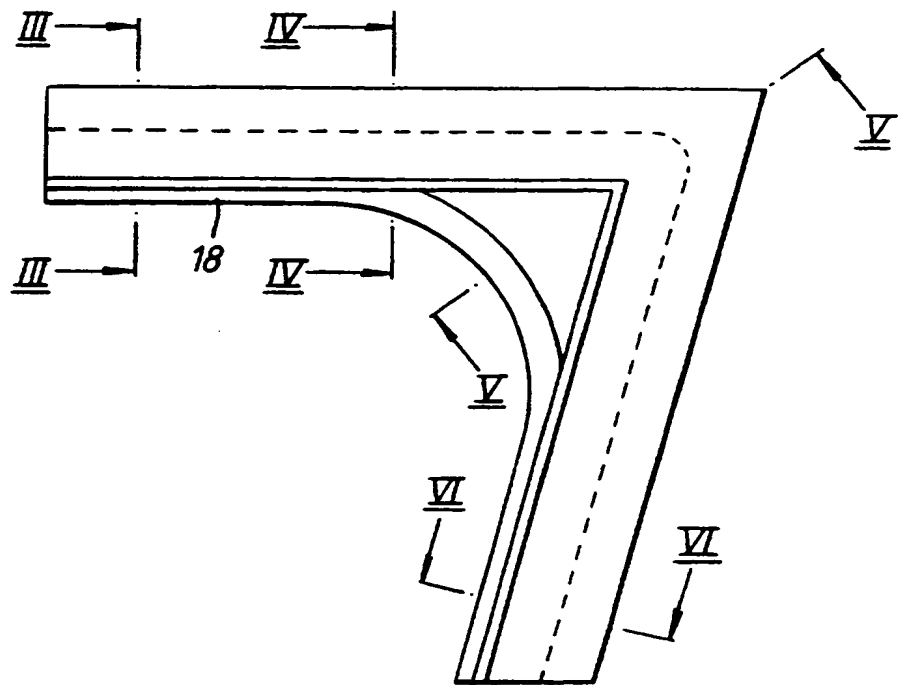
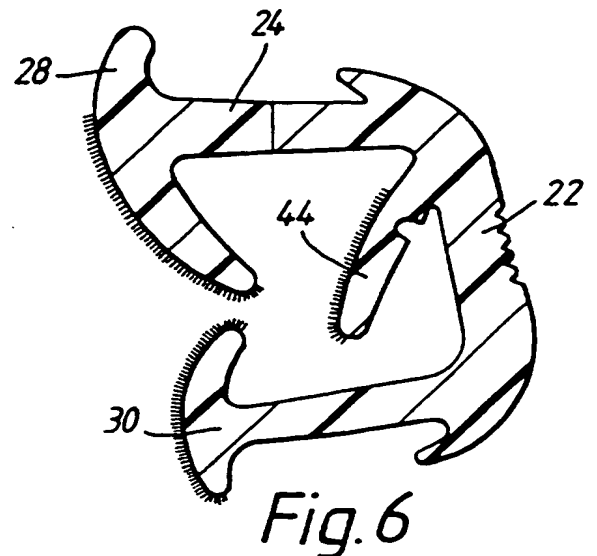
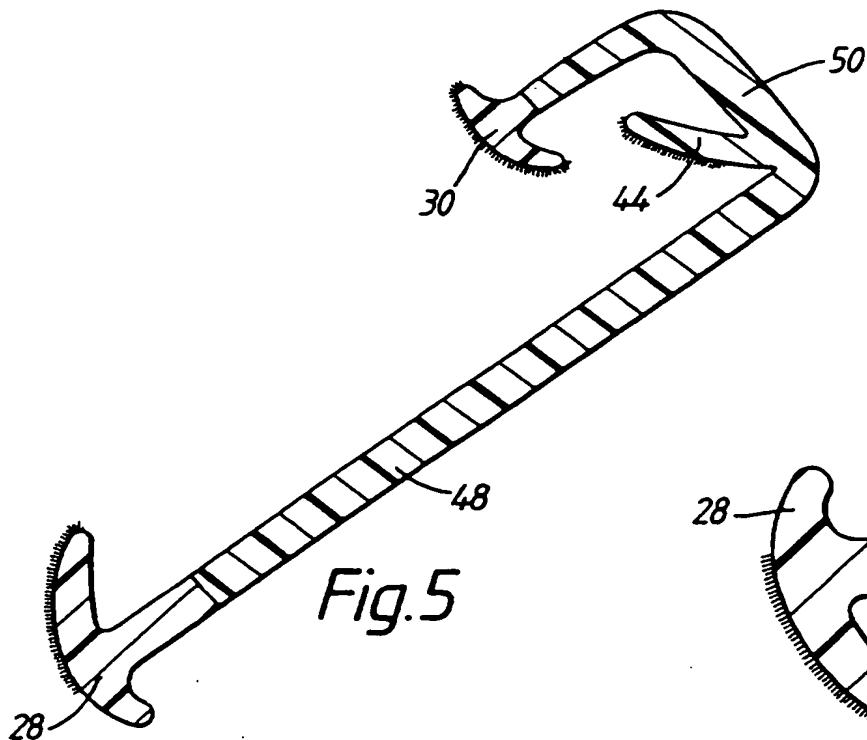
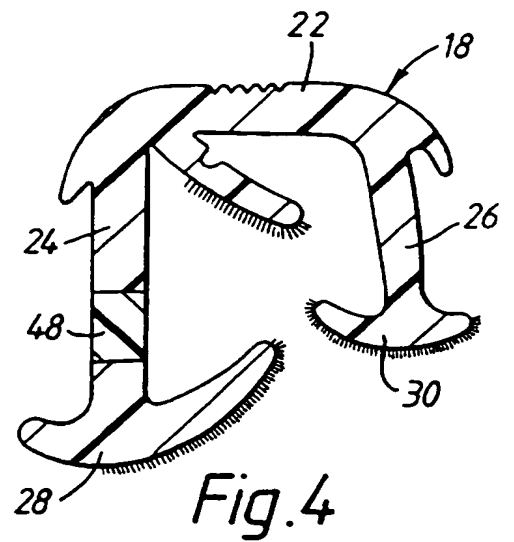
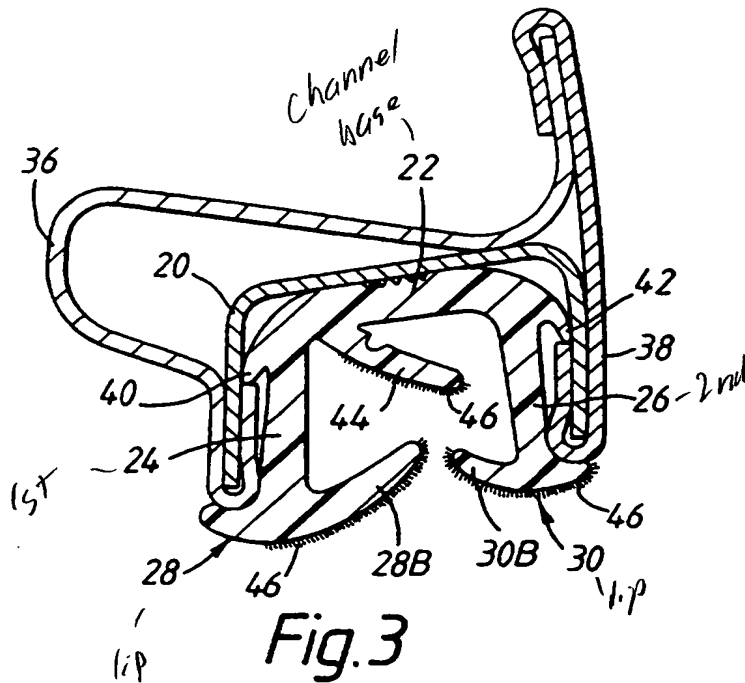
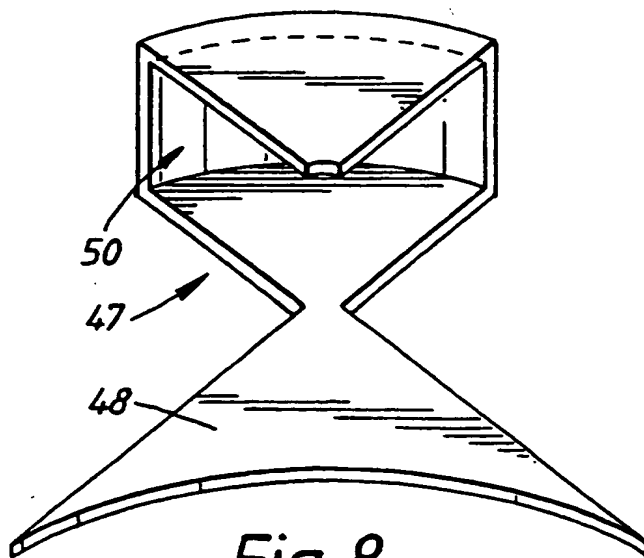
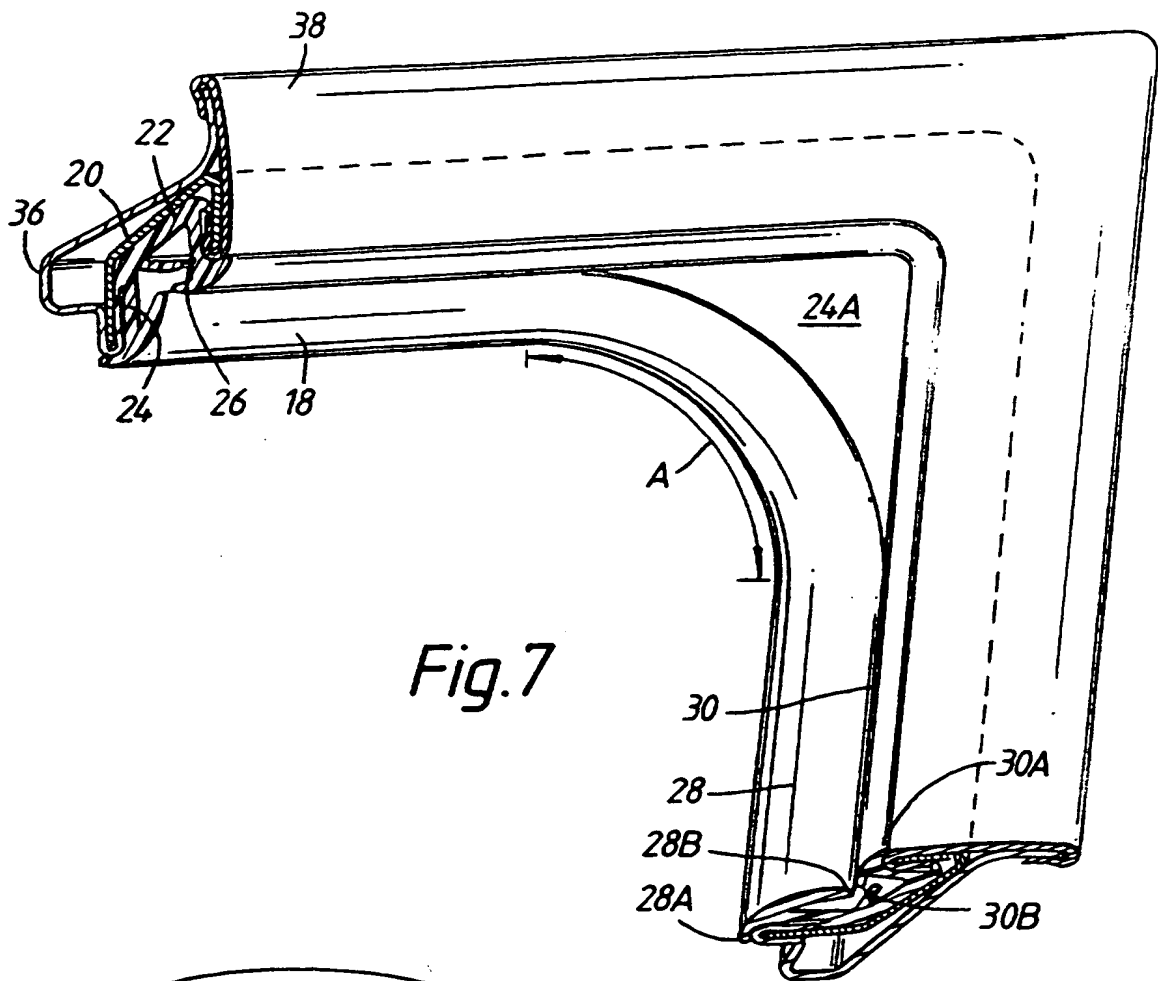


Fig. 2





SEALING AND GUIDING STRIPS

The invention relates to sealing and guiding strips. Sealing and guiding strips embodying the invention, and to be described in more detail below by way of example only, are for use in sealing and guiding slidable panes of window glass in motor vehicle bodies.

According to the invention, there is provided a window sealing and guiding channel for a window opening having a sharp corner, comprising a channel base and first and second integral channel side walls made of flexible material, each side wall having a lip extending along its distal edge, the lip on the first side wall being separated from that side wall over a region extending along a portion of the channel including the sharp corner, the separated lip smoothly bridging across the sharp corner, the lip on the second side wall being separated from that side wall at the corner and mitre-cut there to form a mitre joint matching the sharp angle, and a previously produced insert adhesively secured between the separated lip of the first side wall and the remainder of that side wall over the said region.

According to the invention, there is also provided a window sealing and guiding channel for sealing and guiding a window glass having a sharp corner, the channel having a base and integral first and second channel side walls each having a distal edge carrying a respective lip, the first side wall being cut through to separate a distal edge portion including the respective lip from the remainder of the first side wall, the cut extending along the length of the side wall from a first position on one side of the sharp corner, through the sharp corner and thence to an end of the channel, the second side wall being cut through at the sharp corner to separate a distal edge portion thereof including the respective lip from the remainder of that side wall, the distal edge portion of the second side wall being itself cut through at the sharp corner to form a mitred joint therein matching the sharp corner, the distal edge portion of the first side wall being formed into a smooth curve bridging across the sharp corner, and a previously moulded insert being adhesively secured in position between and spacing apart the distal edge portion of the first side wall and the said remainder thereof, the insert having a size which from the said first position to the sharp corner progressively increases the spacing between the distal edge portion of the first side wall and the remainder thereof and thereafter progressively decreases that

spacing to zero at a second position on the opposite side of the sharp corner to the first position, the distal edge portion and the remainder of the first side wall being adhesively secured together from the said second position to the said end of the channel, the remainder of the first side wall and the remainder of the second side wall and the base of the channel being removed at the sharp corner and replaced by a moulded channel part integrally moulded with the insert.

Sealing and guiding strips for windows in motor vehicle bodies, and embodying the invention, will now be described, by way of example only, with reference to the accompanying diagrammatic drawings in which:

Figure 1 is a side view of a vehicle door;

Figure 2 is an enlarged view of the area II of Figure 1, showing one of the sealing and guiding strips;

Figure 3 is a section on the line III-III of Figure 2;

Figure 4 is a section on the line IV-IV of Figure 2 but with the window frame omitted;

Figure 5 is a section on the line V-V of Figure 2, but with the window frame omitted;

Figure 6 is a section on the line VI-VI of Figure 2 but with the window frame omitted;

Figure 7 is a perspective view of the window frame and sealing strip and corresponding to Figure 2; and

Figure 8 is a perspective view of a moulded insert used in the strip.

Figure 1 shows a vehicle door 10 carrying a window frame 12. A pane of window glass 14 is slidable in a vertical direction in the window frame 12 and can be raised from and lowered into the lower part of the door 10. The window frame 12 is produced from metal or other stiff material and is formed to produce a sharp corner 16.

In a manner to be explained in more detail below, the window frame 12 is of channel-shape in cross-section and supports a sealing and guiding strip 18 produced from flexible material such as plastics or rubber and in which the window glass 14 slides.

The sealing and guiding channel 18 is designed to provide a weather-proof seal for the edge of the window glass and also to impose low friction on the movement of the glass.

Figures 2 and 7 show, to an enlarged scale, the window frame 12 and the sealing and guiding channel 18 in the region II of Figure 1. The window frame 12, which will be described in more detail with reference to Figures 3 - 6, defines a stiff mounting channel 20 (Fig. 7) in which is supported the sealing and guiding channel 18. The channel 18 has a base 22 and side walls 24 and 26. Each of these side walls 24,26 terminates in a respective lip 28,30, the lips having portions 28A and 30A which overlap the respective distal edges of the side walls of the mounting channel 20, and portions 28B and 30B which extend partway across the mouth of the sealing and guiding channel 18.

As shown most clearly in Figure 7, the longitudinal extension of the lip 30 matches the sharp corner 16 of the window frame 12. However, the longitudinal extension of the lip 28 is shaped differently and bridges across the sharp corner 16 in a smooth radius, as indicated over the region A in Figure 7. At the region A, the side wall 24 has to be extended, of course, as indicated at 24A. The smooth radius region A is positioned on

the inside of the window glass 14.

The channel 18 is produced by an extrusion process from plastics or rubber.

Figure 3 shows a cross-section through the extruded channel 18 at the line III-III of Figure 2. Figure 3 also shows the window frame 12 in more detail.

As shown in Figure 3, the window frame 12 comprises channel-shaped metal producing the mounting channel 20, a frame member 36 supporting the channel 20, and an outer trim strip 38. The latter is bent to attach it to one of the walls of the mounting channel 20 and to one of the edges of the outer frame member 36. The latter is bent over the opposite distal edge of the mounting channel 20.

The window channel 18 defines shoulders 40 and 42 on the outsides of the side walls 24, 26 and positioned near the base 22 of the channel. These shoulders 40, 42 engage the distal edges of the bent-over parts of the outer frame member 36 and the trim member 38 and thus locate the window channel 18 securely in position.

Figure 3 also shows that the window channel 18 includes a lip 44 at the base of the channel against which the edge of the window glass abuts when the window is fully closed. The outwardly facing surface of the lip 44 is covered with flock 46 to provide improved sealing and low friction. As the window glass enters the channel, the lip surfaces 28B and 30B are bent inwardly to allow passage of the window glass. The surfaces of the lip portions 28B and 30B which contact the glass are also covered with the flock 46.

The channel 18 is produced to have the cross-section shown in Figure 3 and a length equal to that from points S and T in Figure 1. However, after the extrusion process, a cut is made through the side wall 24 of the channel to sever the lip 28 from the remainder of the side wall. This cut starts at the point U in Figure 1 and continues to the end T of the channel. It will be appreciated that, although the start and end points of this cut are indicated on Figure 1, the cut is in fact made before the channel 18 is mounted on the frame. A previously moulded insert 47 (Figure 8) is then placed in position as will now be described. This insert produces the required sharp corner in the channel wall 26 and the lip 30 and the required extended side wall 24A over the region A.

Figure 4 shows a section through the channel 18 at a position after the beginning U of the cut. As shown in Figure 4, the side wall 24 has been cut through and a moulded portion 48 of the insert 47 has been inserted. The moulded portion 48 provides the desired increase in the length of the side wall 24.

The moulded portion 48 smoothly increases in size towards the corner 16, thus progressively increasing the length of the side wall 24 as shown in Figure 8 and thereby producing the extended side wall portion 24A.

As shown in Figure 8, the moulded portion 48 merges with a channel-shaped moulded portion 50 which is also shown in Figure 5, being a cross-section at the corner 16. The side wall 26 and the lip 30 are cut away to accommodate the channel-shaped portion 50.

At the line VI-VI of Figure 2, the moulded insert 47 no longer exists, and the separated parts of the side wall 24 are simply secured together again as shown in Figure 6 - and this is continued to the end T of the channel 18.

In this way, the sealing and guiding channel 18 can be given a

sharp radius to match the sharp corner 16 of the frame on the outside of the window and a smooth radius on the inside of the window. Because the insert 47 is produced separately by a moulding operation and then secured to the mounted channel 18 merely by adhesive, rather than being moulded *in situ* into the window channel 18, no excessive heat is applied to the channel 18 - which might otherwise damage it and its flocked layers.

The side wall 24 has to be severed along the whole of the length between points U and T because the effect of the smooth radius for the lip 28, over the region A, means that the lip 28 follows a shorter path than the lip 30; the latter of course follows the sharp corner 16. The excess length of the lip 28 can therefore be cut off at the end of the channel T.

Instead, of course, the start U of the cut could be made at or near the position of the line VI-VI of Figure 2 and the cut extended in the opposite direction along the channel 18, that is, to the position S as indicated in Figure 1.

CLAIMS

1. A window sealing and guiding channel for a window opening having a sharp corner, comprising a channel base and first and second integral channel side walls made of flexible material, each side wall having a lip extending along its distal edge, the lip on the first side wall being separated from that side wall over a region extending along a portion of the channel including the sharp corner, the separated lip smoothly bridging across the sharp corner, the lip on the second side wall being separated from that side wall at the corner and mitre-cut there to form a mitre joint matching the sharp angle, and a previously produced insert adhesively secured between the separated lip of the first side wall and the remainder of that side wall over the said region.

2. A channel according to claim 1, in which the side walls and the base are removed at the sharp corner and replaced by corresponding parts of and integral with the said insert, the corresponding parts being adhesively secured in position in the channel.

3. A channel according to claim 1 or 2, in which the lip of the said first side wall is separated from that side wall not only over the said region but also to an end of the channel, the separated lip being adhesively re-secured to the first side wall outside the said region.

4. A channel according to any preceding claim, in which the insert is a moulded insert.

5. A channel according to any preceding claim, in which the channel base, side walls and lips are produced by extrusion.

6. A window sealing and guiding channel for sealing and guiding a window glass having a sharp corner, the channel having a base and integral first and second channel side walls each having a distal edge carrying a respective lip, the first side wall being cut through to separate a distal edge portion including the respective lip from the remainder of the first side wall, the cut extending along the length of the side wall from a first position on one side of the sharp corner, through the sharp corner and thence to an end of the channel, the second side wall being cut through at the sharp corner to separate a distal edge portion thereof including the respective lip from the remainder of that

side wall, the distal edge portion of the second side wall being itself cut through at the sharp corner to form a mitred joint therein matching the sharp corner, the distal edge portion of the first side wall being formed into a smooth curve bridging across the sharp corner, and a previously moulded insert being adhesively secured in position between and spacing apart the distal edge portion of the first side wall and the said remainder thereof, the insert having a size which from the said first position to the sharp corner progressively increases the spacing between the distal edge portion of the first side wall and the remainder thereof and thereafter progressively decreases that spacing to zero at a second position on the opposite side of the sharp corner to the first position, the distal edge portion and the remainder of the first side wall being adhesively secured together from the said second position to the said end of the channel, the remainder of the first side wall and the remainder of the second side wall and the base of the channel being removed at the sharp corner and replaced by a moulded channel part integrally moulded with the insert.

7. A channel according to claim 6, in which the insert is previously produced by a moulding operation.

8. A channel according to claim 6 or 7, in which the respective lips partially bridge across the mouth of the channel for contacting and sealing against opposite sides of the window glass.

9. A channel according to any preceding claim, including a lip within the channel and incliningly extending from the base thereof for engaging an edge of the window glass.

10. A channel according to any preceding claim, in which the window glass is a slidable window glass in a motor vehicle.

11. A window channel according to claim 10, mounted in a rigid frame carried by the door of the motor vehicle.

12. A window sealing and guiding channel, substantially as described with reference to the accompanying drawings.



Application No: GB 9607050.3
Claims searched: 1-12

Examiner: Richard Jupp
Date of search: 12 May 1997

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.O): E1J: JED, JGN

E1R: RRC, RRD, RRF, RRL, RRP, RRQ, RRT, RRV, RRX

Int Cl (Ed.6): B60J: 10/00, 10/02, 10/04

E06B: 3/54, 3/58, 7/16, 7/22, 7/23

Other: Online: World Patent Index

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
A	GB 2285471 A (DRAFTEX INDUSTRIES LIMITED) whole document relevant	
A	GB 2259730 A (TOYODA GOSEI CO. LTD.) whole document relevant	
A	EP 0632184 A1 (HUTCHINSON) see figure 2	
A	US 4616446 A (TOYOTA JIDOSHA KABUSHIKI KAISHA) whole document relevant	

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